

U.S. Pat. App. Ser. No. 10/527,310
Attorney Docket No. 10191/3707
Appeal Brief

[10191/3707]

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES**

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In re Application of: :
Karin Hamsen et al. :
For: DIODE :
Filed: November 28, 2005 : Art Unit: 2818
Serial No.: 10/527,310 :

MAIL STOP APPEAL BRIEF
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**SUPPLEMENTAL/REPLACEMENT APPEAL BRIEF
PURSUANT TO 37 C.F.R. § 41.37**

SIR:

In the above-identified patent application ("the present application"), Appellants mailed a Notice Of Appeal on February 28, 2008 (it was filed on March 3, 2008) from the Final Office Action issued by the U.S. Patent and Trademark Office on August 29, 2007, so that the two-month appeal brief due date was May 3, 2008.

The Appeal brief was mailed on April 28, 2008 and filed on May 2, 2008. A Notice of Non-compliance was mailed on May 8, 2008, so that the one-month response date is June 9, 2008 (since June 8, 2008 is a Sunday).

In the Final Office Action, pending and considered claims 8 to 14 and 16 to 19 were finally rejected. (Claim 15 is withdrawn in response to a restriction requirement). A Response After A Final Office Action (no amendments were made) was mailed on February 28, 2008, and an Advisory Action was mailed on April 7, 2008.

It is understood for purposes of the appeal that any Amendments to date have already been entered by the Examiner, and that the Response After Final does not require entry since it included no amendments.

The previously filed Appeal Brief mailed on April 28, 2008 in support of the appeal of the final rejections of claims 8 to 14 and 16 to 19 was deemed non-compliant in the Notification of Non-Compliant Appeal Brief (37 CFR 41.37) of May 8, 2008. In the Notification: it was stated as to item 4(a) that "The brief does not contain a concise explanation" because the brief "does identify Independent claims 8 and 16, but does not clearly identify which page and line numbers supports the independent claims", as stated in item 10.

The Replacement Appeal Brief is believed to comply with all the requirements of Rule 41.37, and to address the issues raised in Notice as items 4/10.

As concerns items 4/10 of the Non-Compliant Notification, it is noted that the "concise explanation" language of the Rule is like the "concise explanation" requirement of former Rule 37 CFR 1.192, and that the length of the concise explanation provided herein should therefore be acceptable, since it was acceptable under 37 CFR 1.192 and since it specifically defines the subject matter of the relevant claims involved in the appeal. AARON C. DEDITCH (reg. no. 33,865) has filed many appeal briefs in which the concise explanation has ultimately always been accepted by the Patent Office. The Office is encouraged to contact the undersigned if there are any questions as to the description of the claimed subject matter.

It is respectfully submitted that all matters have been corrected and that this Replacement Appeal brief complies with 37 C.F.R. 41.37, and specifically moots the stated reasons for deeming the original Appeal Brief filed on May 2, 2008 (and mailed on April 28, 2008) as non-compliant, so that this Replacement Appeal Brief is compliant. Although no longer required by the rules, this Brief is submitted in triplicate as a courtesy to the Appeals Board.

It is respectfully submitted that the final rejections of claims 8 to 14 and 16 to 19 should be reversed for the reasons set forth below.

1. REAL PARTY IN INTEREST

The real party in interest in the present appeal is Robert Bosch GmbH ("Robert Bosch") of Stuttgart in the Federal Republic of Germany. Robert Bosch is the assignee of the entire right, title and interest in the present application.

2. RELATED APPEALS AND INTERFERENCES

There are no interferences or other appeals related to the present application, which "will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal".

3. STATUS OF CLAIMS

CLAIMS 1 TO 7 ARE CANCELED.

CLAIM 15 IS WITHDRAWN (in response to a restriction requirement).

A. Claims 8, 11, 12, 13 and 14 were rejected as unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 6,160,309 ("Le") in view of U.S. Patent Application Publication No. 2002/0011661 ("Terasaki et al.").

B. Claims 9 and 10 were rejected as unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 6,160,309 ("Le") in view of U.S. Patent Application Publication No. 2002/0011661 ("Terasaki et al."), and in further view of U.S. Patent No. 6,274,823 ("Khandros et al.").

C. Claims 16 to 19 were rejected as unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 6,160,309 ("Le") in view of U.S. Patent Application Publication No. 2002/0011661 ("Terasaki et al."), and in further view of U.S. Patent No. 6,274,823 ("Khandros et al.").

Appellants therefore appeal from the final rejections of pending and considered claims 8 to 14 and 16 to 19. A copy of all of the pending and considered and appealed claims 8 to 14 and 16 to 19 is attached hereto in the Claims Appendix.

4. STATUS OF AMENDMENTS

In response to the Final Office Action mailed on August 29, 2007, Appellants filed a Response After A Final Office Action (with no amendments), which was mailed on February 28, 2008.

It is understood for purposes of the appeal that any Amendments to date have already been entered by the Examiner, and that the Response After Final does not require entry since it included no amendments.

5. SUMMARY OF CLAIMED SUBJECT MATTER

The concise explanation of the summary of the claimed subject matter is as follows, as described in the context of the present application.

A diode according to the claimed subject matter is intended to have the benefits or advantages in which the quantity of the encapsulating material may be reduced, since less epoxy and plastic are needed for the sleeve, and in minimizing combustible materials in the diode. These benefits are evidence of the nonobviousness of the presently claimed subject matter.

In particular, in the context of the claimed subject matter, these advantages may be achieved by using a stepped head wire, which is joined to the head by a soldering layer, for instance, and which forms a housing with a sleeve joined to the base. The cavity inside the housing, which is delimited by the base, semiconductor chip, head, stepped wire connection and sleeve, is smaller than the other designs discussed above, so that only a small quantity of encapsulating material is required to fill the cavity while stability is not reduced. Still another benefit of the present claimed subject matter is that there is no fire risk when the diode is overloaded (for instance by polarity reversal of the battery during use in a motor

vehicle which may result of the extremely high temperatures of several hundred degrees) due to the step in the head of the wire and due to being situated inside a sealed housing. (See Substitute Specification, page 2, lines 3 to 23).

As to independent claim 8 (and each of dependent claims 9, 10, 11, 12, 13 and 14, since these claims include features like those of claim 8), it is described as follows in the present application.

The presently claimed subject matter of claim 8 is to a diode, including: a press-fit base including an axially extending mounting region to mount a semiconductor chip. In the context of claim 8, Figure 1 shows the presently claimed subject matter, since it shows a press-fit diode 10 having a press-fit base 11, which changes into an axially extending mounting region 12. A semiconductor chip 13 is joined to mounting region 12 of press-fit base 11 by a soldering layer 14. (See Substitute Specification, page 3, lines 3 to 7).

As to claim 8 it also includes the feature of a head wire provided with a head configured to be affixed to the semiconductor chip. Figure 1 shows the presently claimed subject matter, since it shows a head 16 of a head wire 17 which is connected to semiconductor chip 13 by means of an additional soldering layer 15. (See Substitute Specification, page 3, lines 7 to 8).

As to claim 8 it also includes the feature of a stabilization arrangement which include at least a sleeve and an encapsulating material filling cavities; wherein the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material. Figure 1 shows the presently claimed subject matter, since it shows Region 21 of the stepped head wire forming a sealed housing together with press fit base 11 and a sleeve 22. The cavities inside the housing are filled with encapsulating material 23, so that semiconductor chip 13 itself is mechanically fixated. (See Substitute Specification, page 3, lines 12 to 15).

As to independent claim 16 (and each of dependent claims 17, 18 and 19, since these claims include features like those of claim 16), it is described as follows in the present application.

The presently claimed subject matter of claim 16 is to a diode, including: a press-fit base including an axially extending mounting region to mount a semiconductor chip. In the context of claim 16, Figure 1 shows the presently claimed subject matter, since it shows a press-fit diode 10 having a press-fit base 11, which changes into an axially extending mounting region 12. A semiconductor chip 13 is joined to mounting region 12 of press-fit base 11 by a soldering layer 14. (See Substitute Specification, page 3, lines 3 to 7).

As to claim 16 it also includes the feature of a head wire provided with a head configured to be affixed to the semiconductor chip. Figure 1 shows the presently claimed subject matter, since it shows a head 16 of a head wire 17 which is connected to semiconductor chip 13 by means of an additional soldering layer 15. (See Substitute Specification, page 3, lines 7 to 8).

As to claim 16 it also includes the feature of a stabilization arrangement which include at least a sleeve and an encapsulating material filling cavities; wherein the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material. Figure 1 shows the presently claimed subject matter, since it shows Region 21 of the stepped head wire forming a sealed housing together with press fit base 11 and a sleeve 22. The cavities inside the housing are filled with encapsulating material 23, so that semiconductor chip 13 itself is mechanically fixated. (See Substitute Specification, page 3, lines 12 to 15).

As to claim 16 it also includes the feature wherein the head wire is made of copper, a surface of the head wire having a nickel or a nickel alloy coating. The Specification describes that copper may be used as material for the head wire, and the surface may be plated using nickel or a nickel alloy such as nickel phosphorus. (See Substitute Specification, page 4, lines 11 to 13).

As to claim 16 it also includes the feature wherein the encapsulating material is an epoxy. The Specification describes that the cavities inside the housing are filled with

encapsulating material 23 such as epoxy or some other plastic. (See Substitute Specification, page 3, lines 13 to 14).

As to dependent claim 9, it includes the features of claim 8 (as described above) from which it depends and further includes the feature wherein the head wire is made of copper, a surface of the head wire having a nickel or a nickel alloy coating. The Specification describes that copper may be used as material for the head wire, and the surface may be plated using nickel or a nickel alloy such as nickel phosphorus. (See Substitute Specification, page 4, lines 11 to 13).

As to dependent claim 10, it includes the features of claim 9 (as described above) from which it depends and further includes the feature wherein the coating is made of nickel phosphorus. The Specification describes that the surface may be plated using nickel or a nickel alloy such as nickel phosphorus. (See Substitute Specification, page 4, lines 12 to 13).

As to dependent claim 11, it includes the features of claim 8 (as described above) from which it depends and further includes the feature wherein the encapsulating material is an epoxy. The Specification describes that the cavities inside the housing are filled with encapsulating material 23 such as epoxy or some other plastic. (See Substitute Specification, page 3, lines 13 to 14).

As to dependent claim 12, it includes the features of claim 8 (as described above) from which it depends and further includes the feature wherein only the head of the head wire, which is inside the housing, is surrounded by the encapsulating material. The Specification describes that the cavities inside the housing are filled with encapsulating material 23 such as epoxy or some other plastic. (See Substitute Specification, page 3, lines 13 to 14).

As to dependent claim 13, it includes the features of claim 8 (as described above) from which it depends and further includes the feature wherein the head includes at least two regions having different diameters. The Specification describes that head 16 in the exemplary embodiment of Figure 1 has three regions, 18, 19, 20, having different diameters. (See Substitute Specification, page 3, lines 8 to 9).

As to dependent claim 14, it includes the features of claim 8 (as described above) from which it depends and further includes the feature wherein the head is cone shaped or bell shaped. Figure 2 shows another example embodiment of the present invention, which differs from the example embodiment according to Figure 1 merely in that head 16 is cone shaped or bell shaped. (See Substitute Specification, page 3, lines 23 to 25).

As to dependent claim 17, it includes the features of claim 16 (as described above) from which it depends and further includes the feature wherein the coating is made of nickel phosphorus. The Specification describes that the surface may be plated using nickel or a nickel alloy such as nickel phosphorus. (See Substitute Specification, page 4, lines 12 to 13).

As to dependent claim 18, it includes the features of claim 16 (as described above) from which it depends and further includes the feature wherein the head includes at least two regions having different diameters. The Specification describes that head 16 in the exemplary embodiment of Figure 1 has three regions, 18, 19, 20, having different diameters. (See Substitute Specification, page 3, lines 8 to 9).

As to dependent claim 19, it includes the features of claim 16 (as described above) from which it depends and further includes the feature wherein the head is cone shaped or bell shaped. Figure 2 shows another example embodiment of the present invention, which differs from the example embodiment according to Figure 1 merely in that head 16 is cone shaped or bell shaped. (See Substitute Specification, page 3, lines 23 to 25).

In summary, the presently claimed subject matter of claim 8 is to a diode, including: a press-fit base including an axially extending mounting region to mount a semiconductor chip; a head wire provided with a head configured to be affixed to the semiconductor chip; and a stabilization arrangement which include at least a sleeve and an encapsulating material filling cavities; wherein the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material. (See claim 8).

As to dependent claim 9 (which depends from claim 8), this claim further provides that the head wire is made of copper, a surface of the head wire having a nickel or a nickel alloy coating. (See claim 9).

As to dependent claim 10 (which depends from claim 9), this claim further provides that the coating is made of nickel phosphorus. (See claim 10).

As to dependent claim 11 (which depends from claim 8), this claim further provides that the encapsulating material is an epoxy. (See claim 11).

As to dependent claim 12 (which depends from claim 8), this claim further provides that only the head of the head wire, which is inside the housing, is surrounded by the encapsulating material. (See claim 12).

As to dependent claim 13 (which depends from claim 8), this claim further provides that the head includes at least two regions having different diameters. (See claim 13).

As to dependent claim 14 (which depends from claim 8), this claim further provides that the head is cone-shaped or bell-shaped. (See claim 14).

Independent claim 16 is like claim 8 except that it further provides the head wire is made of copper, a surface of the head wire having a nickel or a nickel alloy coating (see claim 9), and that the encapsulating material is an epoxy (see claim 11). (See claim 16).

As to dependent claim 17 (which depends from claim 16), this claim further provides that the coating is made of nickel phosphorus. (See claim 17).

As to dependent claim 18 (which depends from claim 16), this claim further provides that the head includes at least two regions having different diameters. (See claim 18).

As to dependent claim 19 (which depends from claim 16), this claim further provides that the head is cone-shaped or bell-shaped. (See claim 19).

Finally, the appealed claims include no means-plus-function or step-plus-function claims, so that 41.37(v) is satisfied as to its specific requirements for such claims, since none are present here. The present application does not contain any step-plus-function claims because the method claims in the present application are not "step plus function" claims because they do not recite "a step for", as required by the Federal Circuit and as stated in Section 2181 of the MPEP.

6. GROUND OF REJECTION TO BE REVIEWED ON APPEAL

A. Whether claims 8, 11, 12, 13 and 14 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 6,160,309 (“Le”) in view of U.S. Patent Application Publication No. 2002/0011661 (“Terasaki et al.”).

B. Whether claims 9 and 10 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 6,160,309 (“Le”) in view of U.S. Patent Application Publication No. 2002/0011661 (“Terasaki et al.”), and in further view of U.S. Patent No. 6,274,823 (“Khandros et al.”).

C. Whether claims 16 to 19 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 6,160,309 (“Le”) in view of U.S. Patent Application Publication No. 2002/0011661 (“Terasaki et al.”), and in further view of U.S. Patent No. 6,274,823 (“Khandros et al.”).

7. ARGUMENT

**A. The Rejections Under 35 U.S.C. § 103
That Claims 8, 11, 12, 13 and 14 Are Obvious**

Claims 8, 11, 12, 13 and 14 were rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 6,160,309 (“Le”) in view of U.S. Patent Application Publication No. 2002/0011661 (“Terasaki et al.”).

To reject a claim under 35 U.S.C. § 103(a), the Office bears the initial burden of presenting a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish *prima facie* obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and

not based on the application disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Also, as clearly indicated by the Supreme Court in *KSR*, it is “important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements” in the manner claimed. *See KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727 (2007). In this regard, the Supreme Court further noted that “rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.*, at 1396. Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must teach or suggest all of the claim features. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

Still further, the “problem confronted by the inventor must be considered in determining whether it would have been obvious to combine the references in order to solve the problem”, Diversitech Corp. v. Century Steps, Inc., 850 F.2d 675, 679 (Fed. Cir. 1998).

In this regard, the problem addressed by the presently claimed subject matter is as follows:

Press-fit diodes have a press-fit base that is pressed into a matching recess of a fastening element (and that provides a stable thermal and electrical connection between the diode and the rectifier system), and has a mounting section on which a semiconductor chip may be affixed by soldering. A head wire is affixed to the semiconductor chip and to a phase-supply line of the vehicle generator. Since motor vehicle mechanical vibrations exert stress on the diode and its affixation, the diode is encapsulated to establish a keyed connection between the head wire and the press-fit base which is used to provide traction relief for the sensitive semiconductor chip and solder layers between the chip, the press-fit base and the head wire. A collar or sleeve joined to the press-fit base surrounds the semiconductor chip and the head and sections of the head wire, and the resulting space is filled with cast resin or epoxy to ensures stability. A collar at the base fixes together the

semiconductor chip, diode head and head wire after encapsulation with the encapsulating material or cast resin. (See Substitute Specification, page 1, lines 5 to 30).

In particular, Figures 4, 5 and 6 show conventional press-fit diodes, which have no step at the wire shaft or head. As a result, any stability is derived from the encapsulating material in which the wire shaft is embedded. The disadvantage of the approach as compared to the presently claimed subject matter is that to ensure stability, the outer walls or the sleeves of the housing must be considerably longer than with the presently claimed subject matter. Therefore, the cavities to be filled with encapsulating material are also larger than that required by the presently claimed subject matter, and the entire wire head and a section of head wire 17 must thus also be surrounded by encapsulating material to be made stable. (See Substitute Specification, page 4, lines 1 to 8).

Thus, whereas the "conventional" diodes of Figures 4, 5 and 6 require between 0.369 and 0.630 g plastic material as encapsulating material and for the sleeve, the two exemplary embodiments according to the presently claimed subject matter require 0.318 g of which 0.232 g are encapsulating material (Figure 1), or 0.323 g of which 0.242 g are encapsulating material (Figure 2), or 0.316 g in a further optimization of the embodiment according to Figure 2. (See Substitute Specification, page 4, lines 15 to 19).

CLAIMS 8 and 11

Claim 8 is to a diode, including: a press-fit base including an axially extending mounting region to mount a semiconductor chip; a head wire provided with a head configured to be affixed to the semiconductor chip; and a stabilization arrangement which include at least a sleeve and an encapsulating material filling cavities; in which the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material. In this respect, Figures 1 and 2 display this region (21), and the Substitute Specification at page 3, lines 9 to 16, describes this feature. In this way, less epoxy may be used, and the fire risk may be reduced when the diode is overloaded, as explained in the Substitute Specification of the present application.

In contrast, the Le reference nowhere discloses, or even suggests, the feature of a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, as admitted at paragraph 5 on page 2 of the Final Office Action. Further, the protuberance 6c of the secondary Terasaki reference is not shown as, nor is it disclosed as, providing this function of a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing. Indeed, all of Figures 1, 2, and 9 through 14 of the Terasaki reference indicate that the insulating member 7 is not enclosed within a housing, but is instead free to flow outside of the protuberance 6c, side wall 3a, and support electrode body 3.

As to the terse and conclusory assertions in the Advisory Action, these are wholly conclusory in nature. In fact neither reference even concerns the use of a diode which is designed for stability in a motor vehicle. Accordingly, there would be no motivation to combined the references so as to provide the presently claimed subject matter. Still further the wholly conclusory assertions by the Office do not in any way refute the benefits provided by the presently claimed subject matter, and that there is no motivation to combine the references as applied to provide such benefits, since they do not even refer to or operate in the context of the problem addressed by the presently claimed subject matter.

Accordingly, the proposed combination of the Le and Terasaki references does not disclose, or even suggest, the feature of a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, as provided for in the context of claim 8.

It is therefore respectfully submitted that claim 8 is allowable, as is dependent claim 11 (as well as claims 12 to 14).

CLAIM 12

Claim 12 further provides that only the head of the head wire, which is inside the housing, is surrounded by the encapsulating material.

It is respectfully submitted that any review of the references as applied make plain that they do not disclose this feature as provided for in the context of the presently claimed subject matter, where the head wire includes a stepped wire connection having a region.

which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material., as explained above.

It is therefore respectfully submitted that claim 12 is allowable for this further reason.

CLAIM 13

Claim 13 further provides that the head includes at least two regions having different diameters.

It is respectfully submitted that any review of the references as applied make plain that they do not disclose this feature as provided for in the context of the presently claimed subject matter, where the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material, as explained above.

It is therefore respectfully submitted that claim 13 is allowable for this further reason.

CLAIM 14

Claim 14 further provides that the head is cone-shaped or bell-shaped.

It is respectfully submitted that any review of the references as applied make plain that they do not disclose this feature as provided for in the context of the presently claimed subject matter, where the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material, as explained above.

It is therefore respectfully submitted that claim 14 is allowable for this further reason.

B. The Rejections Under 35 U.S.C. § 103 That Claims 9 and 10 Are Obvious

CLAIMS 9 and 10

Claims 9 and 10 were rejected under 35 U.S.C. § 103(a) as unpatentable over Le in view of Terasaki, further in view of U.S. Patent No. 6,274,823 ("Khandros et al.").

Claims 9 and 10 depend from independent claim 8, and are therefore allowable for essentially the same reasons as claim 8, as presented, since the third-level Khandros reference

does not cure - and is not asserted to cure - the critical deficiencies of the Le and Terasaki references as to claim 8. Thus, the proposed combination of the Le, Terasaki, and Khandros references does not disclose, or even suggest, the feature of a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, as provided for in the context of claim 8, from which claims 9 and 10 depend.

Withdrawal of the rejections is therefore respectfully requested.

**C. The Rejections Under 35 U.S.C. § 103
That Claims 16 to 19 Are Obvious**

CLAIMS 16 and 17

Claims 16 to 19 were rejected under 35 U.S.C. § 103(a) as unpatentable over Le in view of Terasaki, further in view of Khandros et al.

Claim 16 is similar to claim 8 except that it includes the features of claims 9 and 11. As explained above, and as admitted at paragraph 32 on page 5 of the Final Office Action, the proposed combination of the Le and Terasaki references does not disclose, or even suggest, all of the features of claim 16.

Further, since the third-level Khandros reference does not cure - and is not asserted to cure - the critical deficiencies of the Le and Terasaki references as to claim 16, the proposed combination of the Le, Terasaki, and Khandros references does not disclose, or even suggest, the feature of a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, as provided for in the context of claim 16.

Accordingly, it is respectfully submitted that claim 16 is allowable for essentially the same reasons as claim 8 (and claims 9 and 11), as are its dependent claims - claim 17 (features correspond to claim 10) *(as well as claim 18 (features correspond to claims 12 and 13), and claim 19 (features correspond to claim 14), as explained below)*.

CLAIM 18

Claim 18 further provides that the head includes at least two regions having different diameters, and that only the head of the head wire, which is inside the housing, is surrounded by the encapsulating material.

It is respectfully submitted that any review of the references as applied make plain that they do not disclose this feature as provided for in the context of the presently claimed subject matter, where the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material. It is also respectfully submitted that any review of the references as applied make plain that they do not disclose this feature as provided for in the context of the presently claimed subject matter, where the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material, as explained above..

It is therefore respectfully submitted that claim 18 is allowable for these further reasons.

CLAIM 19

Claim 19 further provides that the head is cone-shaped or bell-shaped.

It is respectfully submitted that any review of the references as applied make plain that they do not disclose this feature as provided for in the context of the presently claimed subject matter, where the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material, as explained above.

It is therefore respectfully submitted that claim 19 is allowable for this further reason.

Withdrawal of the rejections is therefore respectfully requested, since claims 8 to 14 and 16 to 19 are allowable.

As further regards each of the obviousness rejections, it is respectfully submitted that the cases of In re Fine, *supra*, and In re Jones, 21 U.S.P.Q.2d 1941 (Fed. Cir. 1992), make plain that the Office's generalized assertions that it would have been obvious to modify or combine the references do not properly support a § 103 rejection. It is respectfully submitted that those cases make plain that the Office Action reflects a subjective "obvious to try" standard, and therefore does not reflect the proper evidence to support an obviousness rejection based on the references relied upon. In particular, the Court in the case of In re Fine stated that:

The PTO has the burden under section 103 to establish a *prima facie* case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. This it has not done. . . .

Instead, the Examiner relies on hindsight in reaching his obviousness determination. . . . One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

In re Fine, 5 U.S.P.Q.2d at 1598 to 1600 (citations omitted; italics in original; emphasis added). Likewise, the Court in the case of In re Jones stated that:

Before the PTO may combine the disclosures of two or more prior art references in order to establish *prima facie* obviousness, there must be some suggestion for doing so, found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. . . .

Conspicuously missing from this record is any evidence, other than the PTO's speculation (if it be called evidence) that one of ordinary skill . . . would have been motivated to make the modifications . . . necessary to arrive at the claimed [invention].

In re Jones, 21 U.S.P.Q.2d at 1943, 1944 (citations omitted; italics in original).

That is exactly the case here since it is believed and respectfully submitted that the Office Actions to date offer no evidence whatsoever, but only conclusory hindsight, reconstruction and speculation, which these cases have indicated does not constitute evidence that will support a proper obviousness finding. Unsupported assertions are not evidence as to why a person having ordinary skill in the art would be motivated to modify or combine references to provide the claimed subject matter of the claims to address the problems met thereby. Accordingly, the Office must provide proper evidence of a motivation for modifying or combining the references to provide the claimed subject matter.

Also, the Federal Circuit in the case of In re Kotzab has made plain that even if a claim concerns a “technologically simple concept” — which is not the case here — there still must be some finding as to the “specific understanding or principle within the knowledge of a skilled artisan” that would motivate a person having no knowledge of the claimed subject matter to “make the combination in the manner claimed,” stating that:

In this case, the Examiner and the Board fell into the hindsight trap. The idea of a single sensor controlling multiple valves, as opposed to multiple sensors controlling multiple valves, is a technologically simple concept. With this simple concept in mind, the Patent and Trademark Office found prior art statements that in the abstract appeared to suggest the claimed limitation. But, there was no finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of Kotzab's invention to make the combination in the manner claimed. In light of our holding of the absence of a motivation to combine the teachings in Evans, we conclude that the Board did not make out a proper prima facie case of obviousness in rejecting [the] claims . . . under 35 U.S.C. Section 103(a) over Evans.

In re Kotzab, 55 U.S.P.Q.2d 1313, 1318 (Fed. Cir. 2000) (emphasis added). Here again, there have been no such findings to establish that the features discussed above of the rejected claims are met by the reference relied upon. As referred to above, any review of the reference, whether taken alone or combined, makes plain that the reference simply does not describe the features discussed above of the rejected claims.

Thus, the proper evidence of obviousness must show why there is a suggestion as to the reference so as to provide the subject matter of the claimed subject matter and its benefits.

In short, there is no evidence that the reference relied upon, whether taken alone or otherwise, would provide the features of the claims discussed above. It is therefore respectfully submitted that the claims are allowable for these reasons.

As still further regards all of the obviousness rejections of the claims, it is respectfully submitted that not even a *prima facie* case has been made in the present case for obviousness, since the Office Actions to date never made any findings, such as, for example, regarding in any way whatsoever what a person having ordinary skill in the art would have been at the time the claimed subject matter of the present application was made. (See *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1455 (Fed. Cir. 1998) (the “factual predicates underlying” a *prima facie* “obviousness determination include the scope and content of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art”)). It is respectfully submitted that the proper test for showing obviousness is what the “combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art”, and that the Patent Office must provide particular findings in this regard — the evidence for which does not include “broad conclusory statements standing alone”. (See *In re Kotzab*, 55 U.S.P.Q. 2d 1313, 1317 (Fed. Cir. 2000) (citing *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1618 (Fed. Cir. 1999) (obviousness rejections reversed where no findings were made “concerning the identification of the relevant art”, the “level of ordinary skill in the art” or “the nature of the problem to be solved”))). It is respectfully submitted that there has been no such showings by the Office Actions to date or by the Advisory Action.

In fact, the present lack of any of the required factual findings forces both Appellants and this Board to resort to unwarranted speculation to ascertain exactly what facts underly the present obviousness rejections. The law mandates that the allocation of the proof burdens requires that the Patent Office provide the factual basis for rejecting a patent application under 35 U.S.C. § 103. (See *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984) (citing *In re Warner*, 379 F.2d 1011, 1016, 154 U.S.P.Q. 173, 177 (C.C.P.A.

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1967))). In short, the Examiner bears the initial burden of presenting a proper prima facie unpatentability case — which has not been met in the present case. (See In re Oetiker, 977 F.2d 1443, 1445, 24, U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992))).

Accordingly, pending and considered claims 8 to 14 and 16 to 19 are allowable for the foregoing reasons.

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CONCLUSION

In view of the above, it is respectfully requested that the rejections of finally rejected, pending and considered claims 8 to 14 and 16 to 19 be reversed since these claims are allowable.

Respectfully submitted,

Dated: _____

6/6/008

By: _____

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CLAIMS APPENDIX

1-7. (Canceled).

8. (Previously Presented) A diode, comprising:

a press-fit base including an axially extending mounting region to mount a semiconductor chip;

a head wire provided with a head configured to be affixed to the semiconductor chip;
and

a stabilization arrangement which include at least a sleeve and an encapsulating material filling cavities;

wherein the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material.

9. (Previously Presented) The diode as recited in claim 8, press-fit base, wherein the head wire is made of copper, a surface of the head wire having a nickel or a nickel alloy coating.

10. (Previously Presented) The diode as recited in claim 9, wherein the coating is made of nickel phosphorus.

11. (Previously Presented) The diode as recited in claim 8, wherein the encapsulating material is an epoxy.

12. (Previously Presented) The diode as recited in claim 8, wherein only the head of the head wire, which is inside the housing, is surrounded by the encapsulating material.

13. (Previously Presented) The diode as recited in claim 8, wherein the head includes at least two regions having different diameters.

14. (Previously Presented) The diode as recited in claim 8, wherein the head is cone-shaped or bell-shaped.

15. (Withdrawn) A method for manufacturing a diode, comprising:

- providing a press-fit base, the press-fit base including an axially extending mounting region to mount a semiconductor chip;

- providing a head wire with a head configured to be affixed to the semiconductor chip, the head wire including a stepped wire connection region;

- forming a housing using the stepped wire connection region and a sleeve; and

- filling cavities of the housing with an encapsulating material.

16. (Previously Presented) A diode, comprising:

- a press-fit base including an axially extending mounting region to mount a semiconductor chip;

- a head wire provided with a head configured to be affixed to the semiconductor chip; and

- a stabilization arrangement which include at least a sleeve and an encapsulating material filling cavities;

- wherein the head wire includes a stepped wire connection having a region, which together with the sleeve and the press-fit base forms a housing, the cavities of the housing being filled with encapsulating material;

- wherein the head wire is made of copper, a surface of the head wire having a nickel or a nickel alloy coating; and

- wherein the encapsulating material is an epoxy.

17. (Previously Presented) The diode as recited in claim 16, wherein the coating is made of nickel phosphorus.

18. (Previously Presented) The diode as recited in claim 16, wherein only the head of the head wire, which is inside the housing, is surrounded by the encapsulating material, and wherein the head includes at least two regions having different diameters.

19. (Previously Presented) The diode as recited in claim 16, wherein the head is cone-shaped or bell-shaped.

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EVIDENCE APPENDIX

Appellants have not submitted any evidence pursuant to 37 CFR Sections 1.130, 1.131 or 1.132, and do not rely upon evidence entered by the Examiner.

RELATED PROCEEDINGS INDEX

There are no interferences or other appeals related to the present application.